

Via Electronic Mail and UPS

July 31, 2017



David Turin  
U.S. Environmental Protection Agency  
5 Post Office Square – Suite 100  
Mail Code: OES04-3  
Boston, MA 02109-3912

Re: Hull WPCF Capacity, Management, Operation and Maintenance ("CMOM") Corrective Action Plan  
Town of Hull, MA Administrative Order on Consent, Docket No. CWA-01-AO-16-09

Dear Mr. Turin:

As identified in the Administrative Order on Consent (AOC), Woodard & Curran, on behalf of the Town of Hull is hereby submitting the CMOM Corrective Action Plan for your review and approval.

In Section 1 of the Corrective Action Plan, the CMOM Self-Assessment table was modified to include additional columns for Deficiency, Recommended Corrective Action and Implementation Schedule, to provide information for each Action item indicated from the initial CMOM Self-Assessment. Items that did not have an A in the Action column were not modified.

In Section 3, WPCF equipment process deficiencies were identified from inspection reports you and Inspector Burns prepared after visiting the Hull WPCF on June 4, 2015. Table 3-1 specifically lists the deficiencies noted by the inspection reports, and lists Corrective Actions Planned and the Implementation Schedule. Many of the items noted have been repaired, corrected, and/or made operational since the time of the visit; including:

- Extensive Health & Safety improvements have been made – including gas monitoring in the headworks
- Major electrical preventative & corrective maintenance work was performed; we used the GODWIN Auxiliary pump during this work to provide pumping during power shutdown.
- Several corrective repairs made to emergency generators – both fully functional
- New mechanical headworks screen installed – functioning well
- Major overhaul of influent pump 5 completed
- Rotary Sludge Thickener – significant corrective repairs made
- Multiple aeration tank repairs made, with more currently ongoing to get the backup aeration tanks functional
- Multiple repairs to secondary clarifiers and RAS pumps
- Many SCADA system enhancements and improvements made



- Significant reduction in hydrogen sulfide and debris issues due to multiple O&M programs:
  - Collections - Wet well aerators installed in the remote pump stations – has resulted in better control of FOG, debris and reduced sulfide generation
  - Collections - IN-PIPE bacteria being added at 20 locations in the collection system – reduced sulfide generation and overall reduced sludge production
  - Collections - addition of ferric chloride at Pump Station 6 on an as needed basis
  - WPCF – Primary clarifiers and gravity thickeners taken off-line during summer months – significant reduction in sulfide levels and odors at the plant

In addition, the Fiscal Sustainability and Asset Management Plans have been completed and will form the basis of prioritizing and funding recommended improvements.

Thank you in advance for your timely review. Please do not hesitate to contact us directly with any questions or concerns.

Sincerely,

WOODARD & CURRAN

A handwritten signature in blue ink, reading "Frank J. Cavaleri".

Frank J. Cavaleri  
Senior Principal

Enclosures: CMOM Corrective Action Plan

cc: David Burns, MassDEP Southeast Regional Office  
Philip Lemnios, Town Manager, Town of Hull  
John Struzziery, Director of Wastewater Operations, Town of Hull  
Carol O'Connor, Town of Hull Sewer Department  
Kate Roosa, W&C  
Aram Varjabedian, W&C

PN: 217319



# CMOM CORRECTIVE ACTION PLAN

Hull POTW

980 Washington Street | Suite 325  
Dedham, Massachusetts 02026  
800.446.5518

**woodardcurran.com**  
COMMITMENT & INTEGRITY DRIVE RESULTS

217319.00  
Town of Hull, MA  
July 31, 2017

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## EXECUTIVE SUMMARY

The Town of Hull (Town) is a peninsula community of about 10,000 permanent residents, and 15,000 seasonal residents, located between Hingham Bay and Massachusetts Bay on the South Shore of Massachusetts. The Town's sewer system is comprised of approximately 42 miles of separated gravity sewers, seven sanitary wastewater pumping stations, and over 175 publicly-owned grinder pumps within the low-pressure sewer system, which send flow to the Town's Water Pollution Control Facility (WPCF). The WPCF discharges treated effluent to Massachusetts Bay, regulated under a National Pollutant Discharge Elimination System (NPDES) permit. The WPCF also receives flow from the neighboring towns of Cohasset and Hingham, through a sewer utility Inter-Municipal Agreement (IMA).

On May 1, 2015, Woodard & Curran (W&C) entered a 10-year contract to operate and maintain the treatment and collection system for the Town Sewer Department. As part of ongoing contract operations work, W&C has prepared several versions of recommended capital repairs and improvements to the collection system and pump stations, as well as treatment plant equipment and unit process upgrade recommendations.

On May 1, 2016, the Town entered an Administrative Order on Consent (AOC) with U.S. Environmental Protection Agency (EPA) and MassDEP to address ongoing critical asset repairs and address Sanitary Sewer Overflows (SSO's) within the collection system. The AOC (Docket No. CWA-01-AO-16-09) requires several immediate deliverables, including a Collection Management, Operation and Maintenance (CMOM) Program Manual and Action Plan for the collection system and WPCF. The following deliverables have been submitted in compliance with the AOC timeline:

1. Unauthorized Discharge Summary, delivered July 31, 2016
2. Emergency Response Plan, delivered August 31, 2016
3. I/I Report, delivered August 31, 2016
4. CMOM Self-Assessment, delivered October 31, 2016
5. CMOM Implementation Annual Report, delivered March 31, 2016 (due annually, March 31)
6. CMOM Program Manual, delivered June 30, 2017

Many ongoing operational improvements and asset repairs and upgrades have been accomplished during the past two years, from significant safety upgrades, to improvements to SCADA operational controls, improved odor and corrosion control, and many others. More specific details are summarized in the Annual Operating Report for years 1 and 2, which was submitted as part of the CMOM Program Manual.

On February 14, 2017, the Town executed a Change Order to the Operations and Maintenance contract to provide engineering and support services. The key purpose of this change order was to develop a plan for providing overall engineering and support for many interrelated wastewater utility asset management needs.

The following AOC deliverables remain:

7. CMOM Corrective Action Plan - this document
8. Third-Year CMOM Program Assessment Checklist, due July 31, 2019

In addition to the Administrative Order on Consent deliverables, the Town of Hull completed its Asset Management Plan to MassDEP in fulfillment of the Asset Management and Fiscal Sustainability Planning Grant Program. The draft Asset Management Plan is included in the CMOM Program Manual. The Asset Management Plan intent was to serve as "step one" for the Town's implementation process by providing:

- Written report to provide methodologies, assumptions and data sources for the initial Risk Analysis, and guidance for tools provided to implement comprehensive, proactive approach to infrastructure funding.

- Introduction and Access to Software Tools

From the risk-based approach, several capital improvement items were identified and phased by priority projects. These phasing and implementation timelines for major capital expenditures are highly dependent on the Town's applications for State Revolving Fund (SRF) Loans from Massachusetts Department of Environmental Protection (MassDEP), other outside funding sources, approval of sewer enterprise user rate adjustments, and other funding availability. At this time, four Project Evaluation Forms (PEFs) are being submitted to MassDEP to apply for appropriation of such funding, and further action will be taken when the Intended Use Plan (IUP) is released in January 2018.

Hull is a community with 32% of its residents in low and moderate income households, and a per capita income of \$44,435. While within the Commonwealth's average, it falls within the 68<sup>th</sup> percentile of neighboring communities, Hingham and Cohasset. Town-wide unemployment is 3.2% (December 2016), which exceeded the Statewide rate for the same period of 2.8% (Mass Department of Unemployment Insurance). As the Town works to address the necessary capital actions, projects will be phased based on availability of grants, SRF funding and other financial sources in consideration of other community capital infrastructure needs and recognizing sensitivity of rate and funding impacts.

## 1. CMOM SELF-ASSESSMENT - ACTION ITEMS

### I. General Information – Collection System Description

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule																																																
1	How many people are served by your wastewater collection system?	According to the 2010 U.S. Census report, the Town of Hull has 10,293 people served and in Hingham and Cohasset, approximately 936 people are served. Peddocks Island, part of the Boston Harbor Islands State Park, also discharges small flow to the Hull Sewer System (<100 users). Combined there is a total service population of about 11,330 (~15,000 during summer season).																																																					
2	What is the number of service connections to your collection system? How many: Manholes? Pump stations? Feet (or miles) of sewer? Force mains? Siphons?	<div>Hull has 4,809 service connections (including 4,497 from Hull and 312 from Hingham and Cohasset). There are approximately 2,040 manholes and 210,000 linear feet (40 miles) of gravity sewer (ranging in diameter from 4” to 36”). About 20,000 feet of low pressure sewer serves 175 homes with Town owned grinder pumps, with approximately an additional 25 resident owned grinder pumps. Seven pumping stations ranging in size from 150 gpm to 1,700 gpm with a total length of force mains of approximately 14,000 feet (See Table below for summary of each station). A four-barrel siphon consisting of 1-10", 2-16", and 1-18", 60 feet long was constructed along the interceptor to allow for placement of a 48" drainage culvert under the 36" interceptor.</div> <table><tr><th>Name</th><th>Location</th><th>Generator</th><th>Design Capacity (gpm)</th><th>Approx. Age (years)</th><th>Forcemain Size/Length</th></tr><tr><td>L.S. A</td><td>Valley Beach Rd.</td><td>No*</td><td>200</td><td>35</td><td>4”/840 ft.</td></tr><tr><td>P.S. 1</td><td>Atlantic Ave.</td><td>Yes</td><td>450</td><td>35</td><td>8”/2,050 ft.</td></tr><tr><td>P.S. 3</td><td>George Washington Blvd.</td><td>Yes</td><td>1700</td><td>35</td><td>14”/4,625 ft.</td></tr><tr><td>P.S. 4</td><td>Marginal Rd.</td><td>Yes</td><td>800</td><td>35</td><td>8”/1,000 ft.</td></tr><tr><td>P.S. 5</td><td>Draper Ave.</td><td>Yes</td><td>1600</td><td>35</td><td>14”/530 ft.</td></tr><tr><td>P.S. 6</td><td>L St. Playground</td><td>Yes</td><td>670</td><td>22</td><td>6”/60 ft.</td></tr><tr><td>P.S. 9</td><td>Main St. High School</td><td>Yes</td><td>650</td><td>35</td><td>10”/5,030 ft.</td></tr></table> <div>*Transfer Switch, portable generator connection and portable generator are available.</div>	Name	Location	Generator	Design Capacity (gpm)	Approx. Age (years)	Forcemain Size/Length	L.S. A	Valley Beach Rd.	No*	200	35	4”/840 ft.	P.S. 1	Atlantic Ave.	Yes	450	35	8”/2,050 ft.	P.S. 3	George Washington Blvd.	Yes	1700	35	14”/4,625 ft.	P.S. 4	Marginal Rd.	Yes	800	35	8”/1,000 ft.	P.S. 5	Draper Ave.	Yes	1600	35	14”/530 ft.	P.S. 6	L St. Playground	Yes	670	22	6”/60 ft.	P.S. 9	Main St. High School	Yes	650	35	10”/5,030 ft.					
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3	What is the age of your system (e.g., 30% over 30 years, 20% over 50 years, etc.)?	Significant portions of the collection system date back to the turn of the century. The system is a “separate” sanitary sewerage system, but some sewers are documented back to the 1860’s. Over 50% of the collection system has been constructed since 1977, making the average age of the collection system over 40+ years old.																																																					

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
4	What type(s) of collection system map is/are available and what percent of the system is mapped by each method (e.g., paper only, paper scanned into electronic, digitized, interactive GIS, etc.)? When was the map(s) last updated?	A digitized interactive sewer system GIS database and map was created by scanning and digitizing paper plans covering about 85 to 90% of the town's sewers, forcemains and pump stations. The GIS map/database was mostly based on the 1986 CDM sewer system map/plan. GIS mapping and attribute data is being updated and supplemented on an annual basis during the Town's annual system pipeline and manhole inspections using a GPS unit and smartphone/tablets. The base GIS map has yet to incorporate the recent data gathered in 2015 and 2016, but it is expected that through the Town's annual updates, it will develop a complete, accurate sewer system GIS database and map.	A	1	Approximately 15% of the Town's sewer system remains unmapped in GIS. The remaining Town areas need to be updated and input into GIS system.	Data information gap will be completed and updated.	Ongoing
5	If you have a systematic numbering and identification method/system established to identify sewer system manhole, sewer lines, and other items (pump stations, etc.), please describe.	Yes. According to the Kleinfelder GIS mapping system, manholes, sewer lines, forcemain and pump stations are identified. The GIS map is online and available in the field; field data is gathered with the goal of updating the GIS map on an ongoing basis.	A	2	GIS mapping data as described above is approximately 85% complete.	As Utility Cloud/GIS is updated using record drawings and current field verification, the numbering convention will be maintained and updated.	Ongoing
6	Are "as-built" plans (record drawings) or maps available and used by field crews in the office and in the field?	Hull has "tie-in cards" for approximately 3,240 of the 4,497 Hull connections. For gravity sewer lines, forcemains and pump stations, there are GIS locations, available through an online GIS web mapping profile created by Kleinfelder. There are paper drawings for many sewer projects available at the wastewater facility, and these are utilized or referenced by field crews on as needed basis.	A	3	1,257 sewer tie-cards remain unknown, and all 3,240 sewer tie-cards available are kept in office files (paper copies). Some record drawings are available digitally, most record drawings are un-scanned and available in paper version.	Existing record drawings and tie-cards will be scanned and linked to Utility Cloud for use by field crew. New drawings and information will be added to Utility Cloud. The remaining 1,257 sewer-tie cards will be added if/when field data becomes available.	Ongoing
7	Describe the type of asset management (AM) system you use (e.g. card catalog, spreadsheets, AM software program, etc.)	The current asset management system utilizes several technology tools; including DoForms, SEMS Technologies CMMS, and the GIS system combined with Excel spreadsheets (inventories, calculations).	A	4	There are currently more than five different ways (DoForms, Hach WIMS, SEMS, GIS, Utility Cloud and paper) that information is stored, shared and updated throughout the collection system and the WPCF.	The CMMS, paper files and other record keeping systems will be consolidated to ensure accuracy and timely updates are shared across the system. Using Utility Cloud (a Cloud-based CMMS system) will allow for both Town and Contract Operators to view, update, and track, asset information.	Ongoing

## II. Continuing Sewer Assessment Plan

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Under what conditions, if any, does the collection system overflow? Does it overflow during wet and/or dry weather? Has your system had problems with: <input type="checkbox"/> hydraulic issues, <input type="checkbox"/> debris, <input type="checkbox"/> roots, <input type="checkbox"/> Fats, Oils & Grease (FOG), <input type="checkbox"/> vandalism blockages resulting in manhole overflows, <input type="checkbox"/> basement backups, <input type="checkbox"/> other (specify)? Describe your system's history of structural collapses, and PS or force main failures.	<p>Collection system overflows occur mostly during wet weather events, and the system does not typically experience overflows during dry weather. The collection system has had some problems with structural sewer line and manhole failures, as well as forcemain failures, in addition to backups caused by debris, FOG, and basement backups. However, <i>the hydraulic limitations in the collection system and the WWTP are a concern only during extreme flow events or infrastructure failures.</i></p> <p>Pump Station losses - there have been no pump station losses that have caused sewer overflows in the past couple of years, except for the forcemain issues discussed below.</p> <p>Structural collapses – some corrosion/deterioration of sewers and manholes have occurred in the past causing structural defects that needed to be repaired.</p> <p>Forcemain failures – The forcemain for PS 9 corroded and was replaced in 2011 with a new HDPE Forcemain.  The forcemain for PS 4 had a break and required repair in early 2014. This forcemain has failed multiple times over the years.  15 feet of the end of the forcemain for PS 3 was lined in the summer of 2016 due to corrosion issues.  The manhole and reinforced concrete pipe ("main interceptor") where the forcemain for PS 3 discharges, collapsed in 2002/2003 and required an emergency repair.</p>					
2	How many SSOs have occurred in each of the last three calendar years? What is the most frequent cause?	During the last three years, there have been 29 SSOs (15 in 2013, 5 in 2014 and 9 in 2015). The most frequent cause is mechanical failure, blockages and secondary sludge spills.					
3	Of those SSOs, how many basement backups occurred in each of the last three calendar years? How are they documented?	During the last three years (2013, 2014 and 2015), there has been one documented basement backup. It was documented as an SSO, according to plant records, which are typically documented through daily reports and annual monthly reports.					
4	What is the ratio of peak wet-weather flow to average dry-weather flow at the wastewater treatment plant (or municipal boundary for satellite collection systems)?	The ratio of peak wet weather flow to average dry weather flow is approximately 4.5. For rare, extreme events, ratios as high as 8 (or more) have been observed. The average flow at the plant is 1.7 MGD.					
5	What short-term measures have been implemented or plan to be implemented to mitigate the overflows? If actions are planned, when will they be implemented?	Short term measures that have been implemented include improving the sludge transfer process, prioritizing repairs based on work order comment conditions to reduce mechanical failures, SSO logging improvements, utilization of backup bypass pump systems, and improved photo/follow-up work order documentation through use of tablets and SEMS system.	A	5		Continue to update SOPs on an as needed basis, prioritize repairs and critical spares, both via ongoing contract operations and implementation of the Asset Management Plan, and assess and implement modifications of the Primary distribution box to eliminate overflows	Ongoing

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
6	What long-term measures have been implemented or plan to be implemented to mitigate the overflows? If actions are planned, when will they be implemented?	Long term measures that are in planning include utilizing portable backup pumps as well as permanent backup pumps and improving the general O&M and asset management procedures for the collection system. Long term measures will be discussed further in the CMOM Corrective Action Plan.	A	6	Funding for long term measures is needed.	Capital Improvement Plan identified items for long term funding.	Pending Funding Availability:
7	Describe your preventive maintenance program; how do you track it (e.g., card files, electronically, with specific software)?	The preventative maintenance software program SEMS incorporates work orders generated by plant staff from identification of a task, through work progress to completion and reminders. Preventative maintenance work orders are scheduled on a regular basis, and can be assigned to specific operators for completion. Then, the records can be linked to monthly and annual reports.					
8	How do you prioritize investigations, repairs and rehabilitation? What critical and priority problem areas are addressed more frequently than the remainder of your system? How frequently are these areas evaluated?	<p>The Town inspected and assessed its Reinforced Concrete Pipe (RCP) sewer “<i>main interceptor</i>” pipeline and manholes in 2004 and 2009. From these assessments, Kleinfelder engineers recommended renewal of approximately 12,300 liner feet of interceptor pipeline based on interceptor segments with PACP structural ratings equal to or greater than 4. The poor structural condition was a result of hydrogen sulfide induced corrosion to the internal pipe wall. The recommended renewal project was executed through two construction contracts in 2005 and 2010 with an associated cost of \$2.13 Million (in 2005/2010 dollars). The reported cost included construction and engineering, but not the cost of performing the assessments. The two contracts consisted of cured-in place pipelining (CIPP) of approximately 42% of the sewer interceptor, which ranged between 14 and 36 inches in diameter; as well as renewal of 15% of the interceptor manholes.</p> <p>There have been preliminary evaluations since Woodard &amp; Curran has taken over the Operations and Maintenance of the WWTF in May of 2015, such as evaluating major assets and risk assessment of major forcemain sections. However, a formal strategy and plan of assessment needs to be addressed. The current operations contract with W&amp;C provides some guidance and quotas for performing routine inspection and cleaning of the collection system, including recommended annual quotas for sewer CCTV, sewer cleaning, manhole inspections, grinder pump replacement and wet well cleaning. These inspection and cleaning quotas will be reevaluated and reprioritized as part of the CMOM Corrective Action Plan.</p>	A	7	Under the Contract for Operations, there is no priority order for cleaning and inspection.	Using the results of the Town’s first Asset Management Plan, results revealed a number of priority pipelines, showing risk due to age and material. The segments to be inspected next include these high-risk pipelines.	Pending Funding Availability: <ol style="list-style-type: none"> <li>1. Gunrock</li> <li>2. Interceptor</li> </ol>
9	Are septage haulers required to declare the origin of their “load”? Are records of these declarations maintained? Do any of the declarations provide evidence of SSOs?	No septage is accepted at this time. Landfill leachate from a Cohasset construction material landfill, that was historically trucked to the site for treatment, ceased prior to May of 2015.					

### III.A. Collection System Management: Organizational Structure

	Question	Response	Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Do you have an organizational chart that shows the overall personnel structure for collection system operations, including operation and maintenance staff? Please attach your chart.	Yes. Woodard & Curran has an organizational chart (attached) which outlines the Town and Contract Operator staffing plan and the relationship between the organizations.					

	Question	Response	Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
2	For which jobs do you have up-to-date job descriptions that delineate responsibilities and authority for each position?	All of the Woodard & Curran positions have updated job descriptions and authority requirements.					
3	How many staff members are dedicated to collection system maintenance? Of those, how many are responsible for any other duties, (e.g., road repair or maintenance, O&M of the storm water collection system)? If so, describe other duties.	The Contract Operator has a staff of 6 full time, plus technical support staff, to oversee the wastewater system, both collections and treatment facility operation and maintenance. There are 2 summer interns and other part-time support staff as well. The W&C staff also oversee the operation of the D Street storm water pump station.					
4	Are there any collection system maintenance position vacancies? How long has the position(s) been vacant?	There are no vacancies at this time.					
5	For which, if any, maintenance activities do you use an outside contractor?	Outside contractors are used for: Sewer Jetting Sewer Cleaning CCTV Repairs Wet Well cleaning					
6	Describe any group purchase contracts you participate in.	The Contract Operator participates in several group purchase contracts, such as USA Bluebook, Wind River and Waterline Industries.					

### III.B. Collection System Management: Training

	Question	Response	Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	What types of training are provided to staff?	Safety and technical training are provided to staff regularly in accordance with Contract Operation requirements and MA DEP Operator Certification requirements. Both in-house specialty training and external resources are utilized.					
2	Is training provided in the following areas: general safety, routine line maintenance, confined space entry, MSDS, lockout/tagout, biologic hazards, traffic control, record keeping, electrical and instrumentation, pipe repair, public relations, SSO/emergency response, pump station operations and maintenance, trench/shoring, other (describe)?	Yes. On a monthly basis, staff are required to participate in a safety meeting PureSafety training. Safety training topics include: <ul style="list-style-type: none"> <li>- Hazard Communication (safety data sheets)</li> <li>- Biologic Hazards</li> <li>- Defensive Driving</li> <li>- Lockout/tagout</li> <li>- Fall Protection</li> <li>- Ergonomics</li> </ul> Annual (or as needed) in-plant training is provided for the following items: <ul style="list-style-type: none"> <li>- General Safety</li> <li>- Pump Station Operations and Maintenance</li> <li>- SSO/Emergency Response/EAP</li> <li>- Routine line maintenance</li> <li>- Confined space entry</li> <li>- Electrical and instrumentation</li> </ul>					
3	Which training requirements are mandatory for key employees?	All monthly training items listed above are mandatory for key employees. Additional programs such as forklift training or Qualified Electrical Workers are required for employees who utilize those pieces of equipment.					

	Question	Response	Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
4	How many collection system employees are certified (e.g., NEWEA certification program) and at what grade are they certified?	The Contract Operator Project Manager has a NEWEA Grade 3 Collections System certification. All O&M Staff have the appropriate Mass DEP Wastewater Certifications, and some of the staff have National Association of Sewer System Cleaning Operators (NASSCO) Pipeline Assessment and Certification Program (PACP) certification. One current on-site staff, one technical support staff and the Town of Hull DPW Director are NASSCO/PACP certified. Collections system subcontractors who perform inspections are NASSCO/PACP certified.					

### III.C. Collection System Management: Communication and Customer Service

	Question	Response	Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Describe your public education/outreach programs (e.g., for user rates, FOG, extraneous flow, SSOs etc.)	The Sewer Department mails "Sewer Works" (formerly Down the Drain) newsletters biannually to rate payers with information ranging from introduction to plant activities to emergency management of grinder pumps. The Town also utilizes a webpage for Sewer Department information. We also provide facility tours, when requested, for school children, interns, and other groups.					
2	What are the most common collection system complaints? How many complaints have you received in each of the past three calendar years?	The most common complaints include sewer blockage/backup issues and odor complaints.					
3	Are formal procedures in place to evaluate and respond to complaints?	Hull Sewer Department Office receives calls for sewer related complaints and passes them on to the Contract Operator to respond, per Contract Requirements.					
4	How are complaint records maintained (i.e., computerized)? How are complaints tied to emergency response and operations and maintenance programs?	Complaint records are maintained through work orders generated in SEMS. When a call is received from the Sewer Department, the WWTF is asked to respond or address the complaint as determined by the Sewer Dept. office.	A	8	Most complaints are documented using DoForms/SEMS work order tracking.	Per Contract Operations, Odor, backup and grinder pump service complaints are tracked and managed using DoForms/SEMS. The goal is to track these items using Utility Cloud.	Ongoing

### III.D. Collection System Management: Management Information Systems

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	How do you manage collection system information? (Commercial software package, spreadsheets, data bases, SCADA, etc). What information and functions are managed electronically?	Collection system information is managed by several database systems including SCADA, CMMS (SEMS Technologies coupled with DoForms) and Hach WIMS. SCADA provides real time information associated with the pump stations and stores the data for basic trending. Hach WIMS and the CMMS are used to manage the daily inspection data and maintenance activities for the entire wastewater system.	A	9	As mentioned in Action Item A4, there are several different methods for tracking collection system information.	The goal is to replace SEMS/DoForms with Utility Cloud, a geographically based CMMS program. SCADA and Hach WIMS will continue to be used.	Ongoing
2	What procedures are used to track and plan collection system maintenance activities?	The CMMS system (SEMS Technologies and DoForms) is used to manage and document scheduled, non-scheduled and other maintenance activities (Corrective, Emergency Repair etc.).					
3	Who is responsible for establishing maintenance priorities? What records are maintained for each piece of mechanical equipment within the collection system?	The W&C Operations contract sets basic inspection and cleaning quotas for the collection system. These quotas were developed over 10 years ago and will be updated during the CMOM Corrective Action Plan. For pump stations, there is a wet well cleaning and inspection schedule set by the Contract Operator, which is fulfilled, logged and reported through the SEMS Work Order System. Grinder Pump inspections or maintenance history is maintained by the Town Sewer Department and the Contract Operator. If there are potential issues with the grinder pumps, the Sewer Department receives the call and processes a Work Order request through the Contract Operator.	A	10	Maintenance priorities are set by experience and performance.	The Town adopted a Risk-Based approach, and developed strategies for monitoring and maintaining assets to decrease long term capital costs, as described in the Asset Management Plan.	Continuous direction provided by Sewer Department in coordination with Contract Operator
4	What is the backlog for various types of work orders?	As of October 22, 2016, there are currently 319 backlogged work orders. 25% Collection System 75% Wastewater Treatment Plant					
5	How do you track emergencies and your response to emergencies? How do you link emergency responses to your maintenance activities?	Emergencies are typically processed as an emergency or high priority work order, classified by type. For example, if a blockage is reported at an address, then the inspection of the sewer line and manholes upstream and downstream are documented using a high-priority Manhole Inspection form and any subsequent high-priority work orders. There are separate emergency documentation procedures for SSO's, Grinder Pumps and Safety items. Follow up repairs and inspections are scheduled using Work Order reference number in SEMS database. All forms are completed electronically.					
6	What written policies/protocols do you have for managing and tracking the following information: complaint work orders, scheduled work orders, customer service, scheduled preventative maintenance, scheduled inspections, sewer system inventory, safety incidents,	The WWTF electronically tracks the following items using DoForms and SEMS: - Complaints - Scheduled Service - Customer Service - Scheduled Preventative Maintenance - Scheduled Inspections - Safety Incidents - Emergency Response - Compliance/Overflow Tracking	A	11	Equipment, tool and spare parts inventory and tracking system needs to be updated.	As a part of Contract Operations, the tracking system for spare parts, equipment and tools is being updated using the Utility Cloud Asset Management system. Updates to the tracking system are expected to be ongoing as the asset management system is built out.	Ongoing

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
	emergency responses, scheduled monitoring/sampling, compliance/overflow tracking, equipment/tools tracking, parts inventory?	The Contract Operator is in the process of updating the WWTF O&M Manual which will include an updated equipment and parts inventory tracking procedure.					

### III.E. Collection System Management: SSO Notification Program

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	What are your procedures, including time frames, for notifying state agencies, health agencies, regulatory authorities, and the drinking water authorities of overflow events?	See response to item 2 below.					
2	Do you use the state standard form for recording/reporting overflow events? If not, provide a sample copy of the form that is used.	We use the MA DEP standard form for recording/reporting overflow events. Please refer to the ERP dated 8/26/2016 for specifics.					

### III.F. Collection System Management: Legal Authority

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Are discharges to the sewer regulated by a sewer use ordinance (SUO)? Does the SUO contain procedures for controlling and enforcing the following: <input type="checkbox"/> FOG; <input type="checkbox"/> Infiltration/ Inflow (I/I); <input type="checkbox"/> building structures over the sewer lines; <input type="checkbox"/> storm water connections to sanitary lines; <input type="checkbox"/> defects in service laterals located on private property; <input type="checkbox"/> sump pumps?	Yes. The Town of Hull Permanent Sewer Commission adopted the Sewer Use Ordinance in its current form 10/26/1987. The SUO includes procedures for controlling: FOG Building Structures over Sewer Lines Stormwater Connections Service Lateral Defects Sump Pumps Grinder Pumps Illegal Connections	A	12	The Sewer Use Ordinance was last updated in 1987. The document should be reviewed by the Sewer Department, and updated as appropriate.	Review existing Sewer Use Ordinance, and based on recent findings and additional industry knowledge changes over the last thirty years, update and propose changes to the Sewer Use Ordinance.	Ongoing
2	Who is responsible for enforcing various aspects of the SUO? Does this party communicate with your department on a regular basis?	Enforcement of the SUO falls onto the Town of Hull, Chief Facility Manager (or designee) who communicates with the Contract Operator on a regular basis.					
3	Summarize any SUO enforcement actions/activities that have occurred in the last three calendar years.	Currently inspections to identify sump pumps is covered by the Town bylaw that when a property is transferring ownership, that an inspection is done. Approximately 150 sump pump inspections are performed per year, and only a handful (approximately 7 or 8) have needed correction.	A	13	Sump pump correction tracking system needed.	Create Sump Pump Tracking System.	Ongoing
4	Do you have a program to control FOG entering the collection system? If so, which of the following does it include: <input type="checkbox"/> permits, <input type="checkbox"/> inspection <input type="checkbox"/> enforcement? Are commercial grease traps inspected regularly and who is responsible for conducting inspections?	There is a policy in place about installing grease traps. There is currently not an inspection program.	A	14	There is no formal FOG program.	The Town will update and prepare a FOG program.	Ongoing

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
5	Is there an ordinance dealing with storm water connections or requirements to remove storm water connections?	§149-17 of Hull SUO prohibits stormwater and all other unpolluted drainage from being discharged to sanitary sewers.					
6	Does the collection system receive flow from satellite communities? Which communities? How are flows from these satellite communities regulated? Are satellite flow capaTown issues periodically reviewed?	Yes, there is an Inter-Municipal Agreement (IMA) with Cohasset and Hingham for customer tie in to existing services. For the IMAs, bills are based on water meter readings as provided from the Towns – the flows could be compared to the units billed.					
7	Does the collection system receive flow from private collection systems? If yes, how is flow from these private sources regulated? How are overflows dealt with? Provide details, including contact information for these private systems.	The collection system receives flows from private grinder pumps. For any problems brought to the attention of the Sewer Dept. related to these privately owned grinder pumps, the owners are directed to contact the local vendor, FR Mahoney.					

#### IV.A. Collection System Operation: Financing

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Has an enterprise (or other) fund been established and what does it include: wastewater collection and treatment operations; collection system maintenance; long-term infrastructure improvements; etc.? Are the funds sufficient to properly fund future system needs?	A sewer enterprise fund has been established and it includes wastewater collection and treatment operations – collection system maintenance and debt payment for infrastructure improvements. A\$140K capital budget is included the contracted operations and the Sewer Department budget includes an additional \$200K. The Enterprise fund includes costs of administration and of items such as insurance and payments to the general fund for health insurance, pension, support for accounting, legal, treasurer/collector etc. There is a WWTF Capital Assessment underway, which will include collection system needs, to be presented to the Permanent Sewer Commission for attention.	A	15	Additional funding strategies are necessary in order to meet the rehabilitation, repair and infrastructure upgrades. over the next ten years.	The funding tool product of the Asset Management Plan is intended to project rate increases and funding allocations for planned capital improvement and ongoing rehabilitation projects.	Per Funding Availability
2	How are rates calculated (have you done a rate analysis)? What is the current sewer charge rate? When was it last increased? How much was the increase?	Rates are calculated by taking the total budgeted costs divided by the total number of 100 cubic foot units billed. Hull rates are then offset by rehabilitation fees, permits, and free cash balances. The current rate is \$11.34 and the Hull subsidized rate is \$9.42. This rate went into effect on billing starting 1/1/15-12/31/15 and received during fiscal year 2016. The percent increase was 42%. This increase was necessary as the debt to repair the plant from the failure came on line and the new 10-year contract with the plant operator resulted in increased costs.					
3	What is your O&M budget?	The O&M budget is \$3,026,000, not including debt service.					
4	If an enterprise fund has not been established, how are collection system maintenance operations funded?	N/A					
5	Does a Capital Improvement Plan (CIP) that provides for system repair/replacement on a prioritized basis exist? What is the collection system's average annual CIP budget?	We are currently doing an assessment of the plant and the collection system needs to develop a prioritized CIP. Implementation will be part of the CMOM Corrective Action Plan. Overall budget spent from 2005 to 2015 was an average of \$386,000 per year for collection system work.	A	16	At the time of assessment, there was no formal Capital Improvement Plan in place.	The 2017 Capital Improvement Plan was submitted as a part of the Asset Management Plan.	Pending Funding Availability

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
6	How do you account for the value of your system infrastructure for the Government Accounting Standards Board standard 34 (GASB 34)?	GASB 34 – annually major assets purchased during the fiscal year are provided to the accounting office. Straight-line Depreciation is applied to the assets.					

#### IV.B. Collection System Operation: Hydrogen Sulfide Monitoring and Control

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Are odors a frequent source of complaints? How many have been received in the last calendar year?	Odors are a frequent source of complaint as there are several immediate neighbors surrounding the WWTF. 33 complaints occurred during the last calendar year, with more than half occurring between May and August.					
2	Do you have a hydrogen sulfide problem, and if so, do you have corrosion control programs? What are the major elements of the program?	Hull has extreme hydrogen sulfide problems and related corrosion. This past summer we used (seasonal) ferric chloride addition in the collection system, installed wet well aerators and we are adding IN-PIPE bacteria to 20 locations within the collection system to reduce FOG and sulfides.	A	17	A permanent chemical system to decrease hydrogen sulfide levels is necessary.	Continued use of: <ul style="list-style-type: none"> <li>• Daily H2S monitoring</li> <li>• In-Pipe Bacteria Addition</li> <li>• Wet Well Aeration</li> <li>• Bioxide Addition (Trial)</li> <li>• Ferric Addition (Trial)</li> </ul> Permanent implementation of a chemical system and improved H2S monitoring equipment.	Ongoing  Pending Funding Availability
3	Does your system contain air relief valves at the high points of the force main system? How often are they inspected? How often are they exercised?	The collection system does not contain air relief valves at forcemain highpoints on any of the 7 main pump stations. The grinder pump pressure lines need to be evaluated and inspected to determine the existence and condition of any air/vac relief valves.	A	18	There are several air release valves in the low-pressure system which have not been inspected.	Air release valves need to be purchased as part of critical spare parts, and an SOP needs to be created for inspection and replacement.	Ongoing

#### IV.C. Collection System Operation: Safety

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Do you have a formal Safety Training Program? How do you maintain safety training records?	Yes. The Contract Operator has a formal safety program which outlines training, awareness and protection equipment for all staff and contractors. Safety records are maintained through specific location logs					
2	Which of the following equipment items are available and in adequate supply: <ul style="list-style-type: none"> <li><input type="checkbox"/> rubber/disposable gloves;</li> <li><input type="checkbox"/> confined space ventilation equipment;</li> <li><input type="checkbox"/> hard hats,</li> <li><input type="checkbox"/> safety glasses,</li> <li><input type="checkbox"/> rubber boots;</li> <li><input type="checkbox"/> antibacterial soap and first aid kit;</li> <li><input type="checkbox"/> tripods or non-entry rescue equipment;</li> <li><input type="checkbox"/> fire extinguishers;</li> <li><input type="checkbox"/> equipment to enter manholes; <input type="checkbox"/> portable crane/hoist;</li> <li><input type="checkbox"/> atmospheric testing equipment and gas detectors;</li> <li><input type="checkbox"/> oxygen sensors;</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> rubber/disposable gloves; - YES</li> <li><input type="checkbox"/> confined space ventilation equipment; - YES</li> <li><input type="checkbox"/> hard hats, - YES</li> <li><input type="checkbox"/> safety glasses, - YES</li> <li><input type="checkbox"/> rubber boots; - YES</li> <li><input type="checkbox"/> antibacterial soap and first aid kit; - YES</li> <li><input type="checkbox"/> tripods or non-entry rescue equipment; - YES</li> <li><input type="checkbox"/> fire extinguishers; - YES</li> <li><input type="checkbox"/> equipment to enter manholes; - YES</li> <li><input type="checkbox"/> portable crane/hoist; - YES</li> <li><input type="checkbox"/> atmospheric testing equipment and gas detectors; - YES</li> <li><input type="checkbox"/> oxygen sensors; - YES</li> <li><input type="checkbox"/> H2S monitors; - YES</li> </ul>					

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
	<input type="checkbox"/> H2S monitors; <input type="checkbox"/> full body harness; <input type="checkbox"/> protective clothing; <input type="checkbox"/> traffic/public access control equipment; <input type="checkbox"/> 5-minute escape breathing devices; <input type="checkbox"/> life preservers for lagoons; <input type="checkbox"/> safety buoy at activated sludge plants; <input type="checkbox"/> fiberglass or wooden ladders for electrical work; <input type="checkbox"/> respirators and/or self-contained breathing apparatus; <input type="checkbox"/> methane gas or OVA analyzer; <input type="checkbox"/> LEL metering?	<input type="checkbox"/> full body harness; - YES <input type="checkbox"/> protective clothing; - YES <input type="checkbox"/> traffic/public access control equipment; - YES <input type="checkbox"/> 5-minute escape breathing devices; - N/A <input type="checkbox"/> life preservers for lagoons; - N/A <input type="checkbox"/> safety buoy at activated sludge plants; - YES <input type="checkbox"/> fiberglass or wooden ladders for electrical work; - YES <input type="checkbox"/> respirators and/or self-contained breathing apparatus; -N/A <input type="checkbox"/> methane gas or OVA analyzer; - YES <input type="checkbox"/> LEL metering -YES					

#### IV.D. Collection System Operation: Emergency Preparedness and Response

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Do you have a written collection system emergency response plan? When was the plan last updated? What departments are included in your emergency planning?	Yes, the Contract Operator developed a written Emergency Response Plan (ERP) in August 2016. Town Sewer Department, Town Manager, and Town Emergency Response Committee were coordinated with as a part of the plan.					
2	Which of the following issues are considered: <input type="checkbox"/> vulnerable points in the system, <input type="checkbox"/> severe natural events, <input type="checkbox"/> failure of critical system components, <input type="checkbox"/> vandalism or other third party events (specify), <input type="checkbox"/> other types of incidents (specify)?	Within the Emergency Response Plan, all of the following issues are considered: Vulnerable points in the system (critical pump stations to address immediately, low points in the collection system) Storm Events and Predicted High Flow Scenarios Backup Systems Initiation due to pump failure/generator use SSO's Internet/Electrical Outages Town of Hull Emergency Notification Procedures					
3	How do you train staff to respond to emergency situations? Where are responsibilities detailed for personnel who respond to emergencies?	Staff is trained by holding Mock Storm Drills, as part of the mock drills we update ERP plan and review with staff. ERP defines responsibilities.					
4	How many emergency calls have you had in the past calendar year?	There have been 2 Emergency Calls in the past calendar year.					

**IV.E. Collection System Operation: Engineering – Capacity**

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	How do you evaluate the capacity of your system and what capacity issues have you identified, if any? What is your plan to remedy the identified capacity issues?	Capacity was evaluated previously in 1977, 1984 and 1998 the plant has adequate capacity for normal flow, but not for extreme flow events, such as the “No-Name” storm of 1991. Several requests have been submitted in the past to allow for by-passing of extreme flows beyond the capacity of the sewer system; this currently occurs using portable emergency pumps on an as needed basis.	A	19	Storm and High Tide flow capacity issues have been identified, as several storm events have exceeded 7.8 MGD (Peak Design Flow) over the past 5 years.	Reassessment of the WPCF Outfall Capacity is recommended.	Pending Funding Availability
2	What procedures do you use to determine whether the capacity of existing gravity sewer system, pump stations and force mains are adequate for new connections? Who does this evaluation?	Currently there are no system in place except for the treatment facility influent and effluent flow meters.	A	20	The Town doesn't have a capacity model.	The Town is essentially at full buildout capacity, so a full system model is unnecessary.  For the low-pressure system, a capacity map was created for construction on open lots, and its utilized as needed.	Completed
3	Do you charge hookup fees for new development and if so, how are they calculated?	The town charges a rehabilitation fee – it is based on the Flow Estimation Table from the MA DEP 314CRM 7.15 stating that each bedroom uses 110 gallons a day. The cost per equal dwelling unit (normally a bedroom) is \$500.00. The Flow Estimate Table is used to calculate a equal dwelling unit for places like a restaurant. Each seat in a restaurant uses X gallons per day – for each 110 gallons a day we charge \$500.00					
4	Do you have a hydraulic model of your collection system? Is it used to predict the effects of system remediation and new connections?	No.	A	21	There is no hydraulic model of the collection system.	A hydraulic model of the Main Interceptor is to be completed in 2017.	December 2017

#### IV.F. Collection System Operation: Pump Stations – Inspection

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	How many pump stations are in the system? How often are pump stations inspected? How many are privately owned, and how are they inspected? Do you use an inspection checklist?	7 major pump stations and over two hundred grinder pumps, of which about 175 are owned by the town. See section I.2 for more details.					
2	Is there sufficient redundancy of equipment at all pump stations?	Currently no.	A	22	As of October 2016, there were multiple stations that did not meet sufficient redundancy.	As of July 2017, all pump stations have returned to full station redundancy except Pump Station 3, which is under emergency repairs, to be completed in August 2017.	Completed
3	How are pump stations monitored? If a SCADA system is used, what parameters are monitored?	Pump stations are monitored using SCADA. Flow, power status and communication are monitored. System is old and unreliable, needs to be upgraded to current technology.	A	23	SCADA system currently operates based on hard-wired telemetry system, supplied through Verizon, that was installed in the 1980's and upgraded in the mid-1990's. There are times when the system goes offline due to system issues, making the system unreliable at times.	Long term plans to address this issue include investigating use of radio communication system to connect the pump stations to SCADA.	Pending Funding Availability
4	How many pump station/force main failures have you had in each of the last three years? Who responds to pump station/force main failures and overflows? How are the responders notified?	Two – PS 4 and PS 3  See ERP for response plan					
5	How many pump stations are equipped with backup power sources? How many require portable generators? How many portable generators does your system own? Explain how the portable generators will be deployed during a system-wide electrical outage.	See section I.2.  The portable generator for PS A is kept at the wastewater plant and deployed when needed.					
6	Are operation logs maintained for all pump stations? Are the lead, lag, and backup pumps rotated regularly?	Pump station checks are logged in DoForms daily. Pumps are typically running in alternating control mode.					
7	Is there a procedure to modify pump operations (manually, or automatically), during wet weather to increase in-line storage of wet weather flows? If so, describe.	NO ... possible plan to be evaluated as part of the CMOM Corrective Action Plan	A	24	Currently, there is no procedure for pump modifications during wet weather events to increase in-line storage, as the in-line storage of the Gravity Interceptor has not been assessed.	As a part of the Main Interceptor hydraulic model, in-line storage of the Main Interceptor will be assessed.	Ongoing

**V.A. Equipment and Collection System Maintenance: Sewer Cleaning**

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	What is your schedule for cleaning sewer lines on a system-wide basis? At this frequency, how long will it take to clean the system? How are sewer cleaning efforts documented?	Contract has a quota of 20 % per year, actual is less based on priority needs. To be reevaluated as part of the CMOM Corrective Action Plan. Plan is to utilize PACP guidelines and reporting.	A	25	Prioritization of cleaning is typically done on an as-needed basis.	Per the Asset Management Plan procedure, developed in June 2017, sewer pipe segments are assessed in priority of risk. As this process develops, and better data on condition assessments becomes available, additional information will determine cleaning frequencies.	Ongoing
2	How many linear miles of the collection system were cleaned in each of the past 3 calendar years?	2013 – Approx. 1 mile 2014 – approx. 9.9 Miles inspected, and cleaned as needed 2015 – less than 0.5 miles	A	26	See V.A. Question 2 (A25) response above.	See V.A. Question 2 (A25) response above.	Ongoing
3	How do you identify sewer line segments that have chronic problems and should be cleaned more frequently? Is a list of these areas maintained and cleaning frequencies established?	Kleinfelder December 16 2014 Kleinfelder June 17 2016 To be reevaluated as part of the CMOM Corrective Action Plan.	A	27	Prioritization of cleaning is typically done on an as-needed basis.	Per the Asset Management Plan developed in June 2017, the sewer pipe segments are to be assessed in priority of risk. As this process develops, and better data on condition assessments becomes available, additional information will determine cleaning frequencies.	Ongoing
4	Approximately, how many collection system blockages have occurred during the last calendar year, and what were the causes?	27 Reported blockages since W&C took over in May of 2015 until Oct. 2016	A	28	Public Outreach and/or FOG Program needed.	Per the updated Unauthorized Discharge Summary (included in Appendix A), the second highest cause of SSO's was grease or rag related buildup. It is recommended that the Town review its drafted FOG procedure to assess adoption into Town Regulations.	Ongoing
5	Has the number of blockages increased, decreased, or stayed the same over the past five years?	The number of blockages has stayed about the same.					
6	What equipment is available to clean sewers? Is any type of cleaning contracted to other parties? If yes, under what circumstances?	SL Rat – inspection device Contractors are used for sewer cleaning, both for regular basis and emergency service.	A	29	Contractors are utilized as needed.	Recently, a push-camera was purchased for small diameter inspections (i.e. forcemains and low pressure sewer). The SL-Rat, a blockage inspection device, SOP is under development for use during Customer Calls.	Ongoing
7	Do you have a root control program? Describe its critical components.	There is currently no root control program.					

**V.B. Equipment and Collection System Maintenance: Maintenance Right of Way**

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Is scheduled maintenance performed on Rights-of-Way and Easements? At what frequency? How many manholes in easement areas cannot be located?	Within the last calendar year, there has been no scheduled maintenance within Rights-of-Ways/Easements.	A	30	Sewer easement mapping is incomplete.	Utility Cloud mapping system will allow for onsite changes and mapping of the cross-county easements.	Ongoing
2	Are road paving projects coordinated with the collection system operators? Have manholes been paved over? How many manholes in paved areas cannot be located? Describe any systems in place for locating and raising manholes that have been paved over.	Yes, road paving projects are typically coordinated with the Contract Operator through the Department of Public Works. There have been no known manholes paved over nor are there any known manholes in paved areas which cannot be accessed.					

**V.C. Equipment and Collection System Maintenance: Parts Inventory**

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Do you have a central location for the storage of spare parts?	Spare parts are located in the Wastewater plant					
2	How have critical spare parts been identified?	Not at this time	A	31	A critical spare inventory needs to be updated for WPCF and collection system purposes.	Critical spare parts list for WPCF to be updated as a part of Asset Management Plan.	Ongoing
3	How do you determine if adequate supplies on hand? Has an inventory tracking system been implemented?	Inventories of spare parts are kept on Excel logs, which can help with ordering supplies. A formal inventory tracking system has not been implemented.	A	32	An inventory tracking system needs to be updated for WPCF and collection system purposes.	Excel logs are used for inventory tracking, but the goal is to consolidate to the Utility Cloud (CMMS) system.	Ongoing

**VI.A. SSES: System Assessment**

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Do POTW flow records or prior I/I or SSES programs indicate the presence of public/private inflow sources or sump pumps? Please Explain.	YES Plant historical flow data and prior system assessments indicated public and private I/I					
2	If problems are related to I/I, has a Sewer System Evaluation Survey (SSES) been conducted? When? What is the status of the recommendations?	Various studies have been done over the years 1974 study by Whitman & Howard 1983 Evaluation by Black 7 Veatch 1984 study by CDM 1999 Summary study by Tighe & Bond 2005 Straights Pond area study by W&C Proposed SSES will be part of the CMOM Corrective Action Plan.	A	33	SSES Report has not been conducted recently.	Per the Asset Management Plan completed in June 2017, prioritized areas for proposed rehabilitation includes Gunrock and Interceptor assets. Per the next phase of work, an SSES study is proposed.	Pending Funding Availability
3	Do you have a program to identify and eliminate sources of I/I into the system including private service laterals and illegal connections? If so, describe.	No. CMOM Corrective Action Plan will address the future I/I program to meet permit and MA DEP requirements.	A	34	Current practices are reactive.	An SSES study is proposed.	Pending Funding Availability
4	Have private residences been inspected for sump pumps and roof leader connections?	Programs to identify and remove sump pumps was performed several times in the past.					
5	Are inspections to identify illicit connections conducted during the property transfer process?	Yes. Currently inspections to identify sump pumps is covered by the Town bylaw that when a property is transferring ownership, that an inspection is done.					
6	How many sump pumps and roof leaders have been identified? How many have been removed?	The sump pump inspection bylaw was passed in May 2007. Approximately 7 or 8 have been redirected. (Realtors know that the sump pumps need to be directed outside so they make sure that they are directed outside before we come to inspect them – similar to they change the smoke detectors before the fire department comes to inspect. )					
7	Have follow-up homeowner inspections been conducted?	Follow up inspections were done for the five or six we found.					
8	What incentive programs exist to encourage residences to disconnect roof leaders & sump pumps? (i.e. matching funds, etc.)	No current incentive program					
9	What disincentive programs exist to encourage residences to disconnect roof leaders & sump pumps? (i.e. fines, surcharges)	A fine of \$25.00 per day for each day in violation can be imposed – So far when we have found an illegal sump pump, they fix it the same day so they can sell the property.					

**VI.B. SSES: Manhole Inspection**

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	Do you have a manhole inspection and assessment program?	Manholes are currently inspected as needed based on preventative maintenance capacities. The PACP type 1 assessment using a standard inspection form is currently used. A manhole repair program is needed.	A	35	No formal inspection program.	Risk-based manhole repair will be utilized.	Pending Funding Availability
2	Has a formal manhole inspection checklist been developed?	Yes, a formal manhole inspection checklist has been developed in accordance with NASSCO standards.					
3	How many manholes were inspected during the past calendar year?	277 manholes were inspected between May 1, 2015 and September 30, 2016.					

VII. Energy Use

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	Implementation Schedule
1	What is your annual energy cost for operating your system? For which pieces of equipment do you track energy use?	The approximate annual energy cost for the wastewater treatment plant is \$233,000. Individual pieces of equipment are not tracked for energy usage, but the wastewater plant and the collection system pump stations have individual meters.					
2	Have you upgraded any of your pumps and motors to more energy efficient models? If so, please describe.	The aeration blower system was upgraded in 2002, replacing the mechanical aerators for ½ of the wastewater plant. Several of the pump stations have been retrofitted with VFDs and when motors are replaced, more energy efficient motors meeting current energy efficiency standards are installed.					
3	Have you performed an energy audit in the past three years?	No. An energy audit has not been performed within the last three years.					
4	Where do you use the most energy (fuel, electricity) in operating your collection system?	For the collection system, the highest energy use is the pump stations pump motors and the individual grinders in each household located on the low pressure sewer. We also recently installed wet well aeration units to reduce FOG and ragging issues.					
5	If you have a treatment plant, would you be interested in participating in EnergyStar benchmarking of your treatment plant?	Yes. The Plant would like to be included for participating in an Energy Star benchmarking.	A	36		The Town plans to complete an EnergyStar benchmarking assessment for treatment energy efficiency.	Ongoing

VIII. Other Actions

	Question	Response	*Act	Action Number	Deficiency	Recommended Corrective Action	CMOM CAP Implementation Schedule
1	Describe any other actions that you plan to take to improve your CMOM Program that are not discussed above.	The Town of Hull and its utility stakeholders have recently completed a draft EPA Climate Resiliency Evaluation and Awareness Tool (CREAT) Report which assessed climate change threats to utility assets and will be a helpful tool moving forward for capital planning. The report is under comment and review phase, but pursuit of hazard mitigation grants (including overall collection system improvements for resiliency) will aid in the execution of the CMOM program and its objectives.	A	37	Utility climate-mitigation alternatives have not been fully evaluated.	Using the EPA CREAT tool acquired in 2016, ongoing Capital Improvement project alternatives will be compared. Additional methods for determining Climate Change resiliency upgrades will be adapted as better data is available/methods change over time.	Pending Funding Availability

## 2. UNAUTHORIZED DISCHARGE SUMMARY

Woodard & Curran completed an Unauthorized Discharge Summary report on July 26, 2016, in accordance with the Administrative Order on Consent (AOC). Since January 1, 2016, there have been 11 additional unauthorized discharges, complete list updated and included in Appendix A. The total unauthorized discharges through June 30, 2017 is 41. According to the records, the unauthorized discharges have been steadily decreasing. It is also important to note that there have been several sewer backup reports which have been deemed to be due to private homeowner systems, and as a part of the current Emergency Response Plan, the WPCF generally reports these as unauthorized discharges. These totals are indicated in the Non-POTW column in Table 2-1 below.

**Table 2-1: Reported Unauthorized Discharges**

Year	POTW	Non-POTW	Total
2013	15	-	15
2014	5	-	5
2015	9	-	9
2016	7	2	9
2017	2	1	3
		Total	<b>41</b>

Since the implementation of the Emergency Response Plan (submitted August 31, 2016 in accordance with AOC requirements), there have been several operating improvements such as modification of Standard Operating Procedure, reconfiguration of the Sludge Truck loading process, and communication procedures.

### 2.1 Causes and Factors

Table 2-2 lists SSOs by their cause, with the most frequent causes shown first. Equipment malfunctions were the most commonly-reported cause of overflows in the system, followed by operational error and FOG/debris. These issues are indicative of the need for increased predictive and preventative maintenance (PM) in the system.

**Table 2-2: Causes and Factors of Unauthorized Discharges (2013 – 2017)**

Cause	Dry Weather	Wet Weather	Total	% of Total
Equipment Malfunction	19	3	22	54%
Operational Error	10	0	10	24%
FOG/Debris	8	0	8	20%
Weather Capacity	0	1	1	2%

Table 2-2 also shows the number of SSOs that occurred in wet versus dry weather. SSOs were assumed to occur during wet weather if the previous 48 hours leading to the SSO had rainfall that measured greater than or equal to 0.10 inches. Rainfall data was obtained from National Oceanic and Atmospheric Administration (NOAA) and Weather Underground.

Outfall capacity and/or infiltration and inflow (I/I) appeared to be the direct causes of the Weather Related SSO. The other three wet weather SSO's included rainfall events that varied from 0.35 inches to 2.00 inches in rainfall. The direct cause of the rest of wet-weather SSOs appeared to be the same equipment malfunctions that cause dry-weather SSOs.

### 3. CRITICAL WPCF EQUIPMENT REPAIRS

Per the EPA and MassDEP inspections to the facility on June 4, 2015, there were several treatment process units identified as not operational, which required action to bring back on-line. Over the last 24 months, several process units have been brought online (see Figure 3-1 below for examples) and a summary of the completed and remaining work is included in Table 3-1.

**Figure 3-1: Photos of Completed Equipment Work at WPCF, July 2017**



Top: Headworks with safety railing improvements, Bottom Left: Mechanical Bar Screen in operation, Bottom Right: Rotary Drum Thickener post-cleaning and corrective maintenance improvements.

**Table 3-1: WPCF Implementation Schedule**

Equipment/Process Cited	Deficiency (per inspection reports)	Corrective Action Planned	Implementation Schedule
Headworks Screening	Manual bar screens only, mechanical screen was Inoperable; headworks influent gate removed	New mechanical screen installed and operating. The influent gate is to be replaced Fall 2017.	2017
Primary Clarifiers	Lack of Redundancy, only 1 in service	<i>Short term actions:</i> Perform a trial Modified Ludzack-Ettinger (MLE) process by adding Mixed Liquor (MLSS) recycle to Primary Clarifier #2. While both clarifiers are only used for high flow management, and are currently offline, MLE trial will be to test for improved odor and sludge control during summer season.  <i>Long term actions:</i> Evaluate future use and/or repurposing of primary clarifiers during unit process evaluation.	2017  Pending Funding Availability
Aeration Tanks	Lack of Redundancy, 2 out of 4, out of service	<i>Short term actions:</i> Rehabilitate current offline mechanical aerators (one repaired mechanical aerator on-site and needs to be installed; some RAS piping needs replacement).  <i>Long term actions:</i> Review activated sludge process options to determine long term modifications to the aeration tanks and secondary treatment process.	2017  Pending Funding Availability
Secondary Clarifiers	Lack of Redundancy, only 1 in service	Both secondary clarifiers are functional, repairs have been made to both. Typically, one unit in service during normal flows, a second unit is put on-line during high flow events, but operational inspection is required. <i>Short term actions:</i> perform inspection of each clarifier, and determine parts necessary for repair.  <i>Long term actions:</i> Evaluate process alternatives and then determine repair or replacement of the clarifiers.	2017  Pending Funding Availability
Gravity Sludge Thickeners	Lack of Redundancy, only 1 in service	Gravity Thickener #2 has been abandoned-in-place, and Gravity Thickener #1 is functional, but offline during summer months for odor control and sludge management. Long term use of Gravity Thickeners for sludge processing will be considered during unit process assessment, and tanks may be repurposed for other use.	Pending Funding Availability
Sludge Holding Tanks	Need work and corrosion corrective maintenance/repairs	Above-ground Holding Tank was drained, cleaned and repaired, and is in use. Sludge Holding Tank #2 was drained, cleaned and inspected, and is in use. Sludge Holding Tank # 1 is offline, and needs aeration diffusers.	Pending Funding Availability
Rotary Drum Thickener	Old, Corroded and Operable with no redundancy	Extensive corrosion corrective maintenance was performed, and RDT back to full operation. However, redundancy will be considered as a part of unit process review.	Pending Funding Availability
Disinfection (Chlorination and Dechlorination)	Temporary replacement post-disaster recovery, seems to be operating well	System is fully operational, but a more permanent stormproof solution to be considered during unit process review. Hypochlorite distribution tubing, pumps and containment area temporary repairs have been made.	Pending Funding Availability
Building	Temporary offices still in parking lot	Temporary HVAC is still in place in the Control building, HVAC upgrades and office space repairs have yet to be completed. Overall plant process review may impact the HVAC system design; final planning and implementation will be bundled with WPCF unit process review.	Pending Funding Availability
Emergency Diversion Pump	Available to be set up	CZM Grant for final installation costs was applied for, and final piping layout design is in progress. This work will be phased with the Influent Gate Work, as the Backup pump will be used as bypass pump for Headworks channel repairs, then moved to a permanent location.	2018
Emergency Generators	Smaller one needs preventative maintenance to be operable	Both generators and transfer switches have been repaired; Preventative maintenance ongoing as required.	Completed (2016)

## **APPENDIX A:        UNAUTHORIZED DISCHARGE SUMMARY**

Date	a. Type of Asset which the unauthorized discharge occurred from	b. Location	c. Cause of unauthorized discharge	c.2. Detailed Cause	d. If caused by a blockage, identify	e. If caused by mech, elec, or struc. Failure, the date of last inspection, maintenance, or repair of failed asset	f. Begin Date & Time	g. Stop Date & Time	h. Notification Source	i. Estimated Gallons Released	j. Method used to estimate volume	k. Did the release reach any portion of the Town's MS4	l. Did the release reach a wetland or surface water? If so, include the name and exact location where?	m. Measures taken to min. the vol. and duration of the unauthorized discharge	n. Measures taken to clean the area where the unauthorized discharge occurred	o. Corrective actions taken to prevent reoccurrence of unauthorized discharges at the same location	p. Date of the last unauthorized discharge in the same general location	If the release occurred in the ground, provide the location of the nearest down-gradient catch basin and the name of the receiving water to which the catch basin discharges
2/28/2013	WPCF	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical	Entire loss of facility due to influent pump failure and lack of bypass pumping availability	N/A	2/28/2013	2/28/2013, 3:45 AM	3/2/2013, 10:55 PM	On-site staff (Dan Calnen)	11,500,000	flow totalizer plus temporary pump capacities	Yes	Yes, Hull Bay Boston Harbor	Portable generators, portable pumps	N/A	Replaced valves, repaired pumps & shafts	N/A	In WPCF driveway Hull Bay
3/3/2013	Hose	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Hose Coupling Leak	3/3/2013, 11:45 AM	3/3/2013, 11:55 AM	On-site staff (Pete Nyberg)	50	Visual	Yes	No	Stopped pump	Washed down area	Replaced coupling on hose	2/28/2013	In WPCF driveway Hull Bay
3/3/2013	Temporary influent pump discharge hose	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Influent Discharge Connection Leak	3/3/2013, 10:00 PM	3/3/2013, 10:05 PM	On-site staff (Michael Burke)	10	Visual	No	No	Stopped pump	N/A	Replaced pipe "O" ring, reinforced pipe connection, tested under pressure	2/28/2013	In WPCF driveway Hull Bay
3/3/2013	Temporary effluent pump discharge hose	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Effluent Discharge Connection Leak	3/3/2013, 10:30 PM	3/3/2013, 10:35 PM	On-site staff (Michael Burke)	100	Visual	No	No	Stopped pump	N/A	Replaced broken discharge pipe	2/28/2013	In WPCF driveway Hull Bay
3/4/2013	Discharge line	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Hose Coupling Leak	3/4/2013, 7:10 AM	3/4/2013, 7:15 AM	On-site staff (Thomas Azevedo)	5	Visual	No	No	Stopped pump	Cleaned area	Re-attached coupling and strapped coupling in place	3/3/2013	In WPCF driveway Hull Bay
3/8/2013	Discharge line	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Secondary Effluent Hose Coupling Leak	3/8/2013, 1:28 PM	3/8/2013, 1:35 PM	On-site staff (John Marcin)	138	Visual	No	No	Stopped pump	Washed down driveway	Re-attached coupling and strapped coupling in place	3/4/2013	In WPCF driveway Hull Bay
3/11/2013	Discharge line for temporary secondary effluent pump	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Hose Coupling Leak	3/11/2013, 1:28 PM	3/11/2013, 1:35 PM	On-site staff (Jim Nyberg)	240	Visual	Yes	No	Stopped pump	Washed down driveway	Hose coupling re-attached and strapped in place	3/8/2013	In WPCF driveway Hull Bay
3/19/2013	Suction line	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical	Leak while changing suction line	N/A	N/A	3/19/2013, 9:50 PM	3/19/2013, 10:05 PM	On-site staff (Kevin Lukasiewicz)	10	Visual	No	No	N/A	N/A		3/11/2013	In WPCF driveway Hull Bay
3/20/2013	Temporary influent pump discharge line	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	Hose Coupling Leak	3/20/2013, 9:50 PM	3/20/2013, 10:05 PM	On-site staff (Jason O'Brien)	83	Visual	No	No	Stopped pump	N/A	Re-attached coupling, strapped down coupling in place	3/19/2013	In WPCF driveway Hull Bay
4/1/2013	Temporary effluent piping	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical	Leak occurred during pipe disconnection for removal	N/A	N/A	4/1/2013, 3:50 PM	4/1/2013, 4:00 PM	On-site staff (John Marcin)	50	Visual	No	No	N/A	N/A	N/A	3/20/2013	In WPCF driveway Hull Bay
4/5/2013	Sludge truck valve	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Human error		N/A	N/A	4/5/2013, 6:30 AM	4/5/2013, 6:32 AM	On-site staff (Rick Sutton)	1	Visual	No	No	N/A	N/A	New SOP for sludge truck loading	4/1/2013	In WPCF driveway Hull Bay
4/22/2013	Temporary influent pump hose	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	N/A	4/22/2013, 11:00 AM	4/22/2013, 11:10 AM	On-site staff (John Marcin)	500	Visual	No	No	Pump stopped	N/A	Reconnected hose, strapped hose to influent pump	4/5/2013	In WPCF driveway Hull Bay
5/22/2013	Temporary influent pump hose	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	4/22/2013	5/22/2013, 11:00 AM	5/22/2013, 1:00 PM	On-site staff (John Marcin)	400 (200 inf/200 eff)	Visual	No	No	N/A	N/A	None, spill occurred while dismantling temporary piping	4/22/2013	In WPCF driveway Hull Bay
5/25/2013	Primary clarifier splitter box	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	N/A	5/25/2013, 8:15 PM	5/25/2013, 8:25 PM	On-site staff (Eric Sutton)	500	Visual	Yes	No	N/A	Raked the area	N/A	5/22/2013	In WPCF driveway Hull Bay
6/8/2013	WWTP Grit Chamber	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Mechanical		N/A	N/A	6/8/2013, 2:30 AM	6/8/2013, 2:50 AM	On-site staff (Chuck Antoine)	unknown	N/A	No	No	N/A	N/A	N/A	5/25/2013	N/A
1/23/2014	Sludge transfer hose	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987	Human Error		N/A	N/A	1/23/2014, 1:15 PM	1/23/2014, 1:16 PM	On-site staff (Chuck Antoine)	1,600	Based on amount in vactor after cleanup	No	No	Shut down pump	Washed down area after vactor cleaned up	Lockout/tagout, new SOP for truck transfer	6/8/2013	In WPCF driveway Hull Bay
2/13/2014	Station 4 force main	12 Marginal Rd (Sewer station #4) N 42 degrees 16.308' W 070 degrees 51.991'	Mechanical	Broken Forcemain	N/A	N/A	2/13/2014, 10:00 PM	2/14/2014, 1:30 AM	On-site staff (Chuck Antoine)	55,000	Estimate based on station flow	No	No	Shut down pump	Washed down area after vactor cleaned up	Lockout/tagout, new SOP for truck transfer	N/A	In WPCF driveway Hull Bay
3/30/2014	Manhole	13 Rockland Circle (coordinates not available)	Weather	I/I Surcharged Manhole	N/A	N/A	3/30/2014, 3:00 PM	3/30/2014, 5:49 PM	Hull Police	8,500	Visual	No	Yes, Wetlands between G.W. Blvd and Rockland Circle	Portable pumps at station, trucks to haul	No	Station pumps removed and repaired	N/A	Rockland Circle Hull Bay
4/1/2014	Backup into property	67 Highland Ave (coordinates not available)	Blockage		Debris in main	N/A	4/1/2014, 5:15 PM	41730.72917	Hull Police	3	Visual	No	No	Used jetter to clear the line	Resident cleaned up	N/A	N/A	Highland Ave Hull Bay

Date	a. Type of Asset which the unauthorized discharge occurred from	b. Location	c. Cause of unauthorized discharge	c.2. Detailed Cause	d. If caused by a blockage, identify	e. If caused by mech, elec, or struc. Failure, the date of last inspection, maintenance, or repair of failed asset	f. Begin Date & Time	g. Stop Date & Time	h. Notification Source	i. Estimated Gallons Released	j. Method used to estimate volume	k. Did the release reach any portion of the Town's MS4	l. Did the release reach a wetland or surface water? If so, include the name and exact location where?	m. Measures taken to min. the vol. and duration of the unauthorized discharge	n. Measures taken to clean the area where the unauthorized discharge occurred	o. Corrective actions taken to prevent reoccurrence of unauthorized discharges at the same location	p. Date of the last unauthorized discharge in the same general location	If the release occurred in the ground, provide the location of the nearest down-gradient catch basin and the name of the receiving water to which the catch basin discharges
6/7/2014	Sludge holding tank	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987'	Mechanical		N/A	N/A	6/7/2014, 8:30 AM	6/7/2014, 8:35 AM	On-site staff (Joe Basler)	750	Pump capacity (150 gpm) X spill time (5 min)	No	No	Stopped pumping	Vactored up spill, spread line	Replaced level probe inside holding tank	1/23/2014	N/A
5/1/2015	Sludge hose used for hook-up to Truck	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987'	Human Error		N/A	1/23/2014	5/1/2015, 6:30 AM	5/1/15, 6:33 AM	On-Site Staff	90	Visual	No	No				6/8/2013	In WPCF driveway Hull Bay
6/10/2015	Clay sewer main	14 Vautrinot Ave N 42 degrees 18.132' W 070 degrees 54.484'	Blockage		Stray brick in pipe	N/A	6/10/2015, 10:49 AM	6/10/2015, 4:00 PM	Hull DPW (Jim Dow)	30	Visual	No	No	Hired a vactor/jetter to clear the line	Area excavated and clean fill provided	N/A	N/A	Vautrinot Ave @ Main St Hull Bay
6/21/2015	Manhole	11 Highland Ave N 42 degrees 18.106' W 070 degrees 54.450'	Blockage		Rags, grease, brick fragments in manhole	N/A	6/21/2015, 8:00 PM	6/21/2015, 11:40 PM	Hull Police	345	Visual	No	No	Used jetter to clear the line	N/A (heavy rain at 10 pm)	N/A	N/A	Highland Ave @ Main St Hull Bay
7/2/2015	Manhole	9 Highland Ave N 42 degrees 18.118' W 070 degrees 54.435'	Blockage		Collapsed pipe	N/A	7/2/2015, 7:30 AM	7/3/2015, 10:00 AM (repaired)	Hull Police	20	Visual	No	No	Used jetter to clear the line	Excavated area, clean fill used	N/A	N/A	Highland Ave @ Main St Hull Bay
7/16/2015	Bypass pump	165 Main St (Sewer station #9) N 42 degrees 18.266' W 070 degrees 55.130'	Mechanical		N/A	N/A	7/16/2015, 3:30 PM	7/16/2015, 3:31 PM	On-site staff (Rick Sutton)	20	Visual	No	No	Stopped pumping	Liquid evaporated on surface	Set-up new SOP for setting up temporary bypass pumping	N/A	Main St Hull Bay
7/31/2015	Gravity thickener blend box	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987'	Blockage		Sludge	N/A	7/31/2015, 7:30 AM	7/31/2015, 7:35 AM	On-site staff	750	Based on liquid that went into offline tank	No	No	Stopped Pumping	Pumped sludge, washed down area, raked grass applied lime	Cleaned out clogged inlet, evaluate installation of shut-off float	5/1/2015	In WPCF driveway Hull Bay
8/17/2015	Sludge truck	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987'	Human Error		N/A	5/1/2015	8/17/2015, 8:00 AM	8/17/2015, 8:00 AM	On-site staff (John Carrier)	50	Visual	No	No	Stopped Pumping	Washed down area, wet vacuumed driveway, sprayed area with diluted hypo solution	Reviewed truck loading SOP	7/31/2015	In WPCF driveway Hull Bay
11/5/2015	Sewer main	245 Nantasket Ave N 42 degrees 16.328' W 070 degrees 51.523'	Mechanical	Gas company broke the sewer line, did a temporary repair to continue their work then notified us the following morning	N/A	N/A	11/5/2015, 6:00 PM	11/6/2015, 9:50 AM	National Grid gas company	unknown	N/A	No	unknown	N/A	Break occurred inside an excavation hole	Informed gas company to notify us immediately	N/A	N/A
11/25/2015	Bypass pipe connection	42 Valley Beach Ave N 42 degrees 16.074' W 070 degrees 50.758'	Mechanical		N/A	N/A	11/25/2015, 10:30 AM	11/25/2015, 10:30 AM	On-site staff (Aram Varjabedian)	15	Visual	No	No	Stopped pumping	None, water drained into open manhole	Reviewed SOP to update	N/A	Valley Beach Rd Nantasket Beach
2/19/2016	Home	25 Main Street	Blockage	Blocked lateral from home, homeowner opened cleanout in driveway to relieve. Lateral on property little/no pitch causing rags to accumulate in line. Jetted/rodded, but eventually, had to be dug up, cleared, repaired.	Rags/Debris	N/A	2/19/2016 9:15	2/19/2016 11:15	Email	~5-10	Visual	NO	NO		NO	After jetting/rodding by Windriver, dug up and repaired by Hub Construction		N/A
3/15/2016	Pump Station	Pump Station #3 (13 Rockland Circle)	Mechanical	Valve exercising for forcemain isolation valve (which was stuck open); Suspect failure of packing/packing gland. Sub-contractor able to stop leak by closing valve actuator.	N/A	3/30/2014	3/15/2016 10:15	3/15/2016 10:16	Email	~2-8	Visual	NO	NO		YES	Lime applied to area around gate box; Gate box itself was vacuumed		N/A
3/29/2016	Home	28 Winthrop Avenue	Blockage	Homeowner line blocked. Found lateral discharges into manhole, which was plugged. Some back up into basement of home, when plumber attempted to jet the pipe.	Service connection blocked	N/A	3/29/2016	3/29/2016	Email	25-50	Visual	NO	NO		YES	Manhole obstruction initially worked on by plant staff, then had Rosano-Davis Pumping pump out/clean the manhole.		N/A
4/14/2016	WWTF	WWTF (1111 Nantasket Avenue)	Human Error	Operator Error - 12-inch pipe had not drained after use with the auxillary pumping system, and remaining sewage overflowed after pumping.	N/A	N/A	4/14/2016 8:30	4/14/2016 8:32	Call then Email	~50-75	Visual	NO	NO		YES	Lime applied to grassy area adjacent to spill		N/A
5/14/2016	Business	514 Nantasket Ave	Blockage	510-520 Nantasket Ave - blockage on private property which affected multiple tennants. Sewage backed from a basement grease interceptor, and sump pump in basement pumped out liquid to the outside driveway area. Some of this water made it to nearby MS4 catch basin, which may have drained to the Atlantic Ocean.	Grease	N/A	5/14/2016 14:30	5/14/2016 15:00	Phone Message	20-30	Visual	YES	Unknown		Unknown	Sewer Dept checked sewer mains, and they were clear. Blockage was in private sewer line on property. Building owner contacted drain company to clear the line.		Unknown

Date	a. Type of Asset which the unauthorized discharge occurred from	b. Location	c. Cause of unauthorized discharge	c.2. Detailed Cause	d. If caused by a blockage, identify	e. If caused by mech, elec, or struc. Failure, the date of last inspection, maintenance, or repair of failed asset	f. Begin Date & Time	g. Stop Date & Time	h. Notification Source	i. Estiamated Gallons Released	j. Method used to estimate volume	k. Did the release reach any portion of the Town's MS4	l. Did the release reach a wetland or surface water? If so, include the name and exact location where?	m. Measures taken to min. the vol. and duration of the unauthorized discharge	n. Measures taken to clean the area where the unauthorized discharge occurred	o. Corrective actions taken to prevent reoccurrence of unauthorized discharges at the same location	p. Date of the last unauthorized discharge in the same general location	If the release occurred in the ground, provide the location of the nearest down-gradient catch basin and the name of the receiving water to which the catch basin discharges
6/7/2016	Home	35 Elm Avenue	Mechanical	Staff responded to a home experienceing sewer back-up to find that a privately-owned grinder pump had malfunctioned and caused spillage into homeowners basement. The Board of Health and pump truck was dispatched to pump out chamber and was repaired on 6/8/16 by Rosano Davis.	N/A	Unknown	6/7/2016 11:56	6/7/2016 13:30	Email	Unknown	N/A	NO	NO		Unknown	Advised owner to apply Lime; Rosano Davis pumped out sewage on 6/7 and returned on 6/8 to complete repairs to grinder pump.		N/A
7/26/2016	WWTF	WWTF (1111 Nantasket Avenue)	Human Error	Operator Error - While exercising large influent pumps that discharge to the 16" forcemain, the wet well level escalated to initiate larger pumping capacity, which overflowed the primary clarifier distribution box. As soon as the overflow was discovered, the pumps were put into hand operation mode, and lime was applied to the base of the surcharged distribution box. The SOP procedure for exercising influent pumps was reviewed by the team.	N/A	5/25/2013	7/26/2016 10:00	7/26/2016 10:02	Email	<20	Visual	NO	NO		YES	Yes - area was cleaned and standard operator procedures were reviewed		N/A
12/19/2016	Home	205 Atlantic Avenue	Blockage	Hull Assistant Building Inspector, Bart Kelley, notified Hull WPCF of overflowing sewer manhole near 205 Atlantic Avenue. Upon arrival, the crew contacted Rosano-Davis septic company to pump the surcharged sewer line. The road surface was vacuumed and adjacent areas were cleaned and lime was applied. After the line was drained, and peak flow subsided, the main sewer line was jetted and 5 manholes were inspected.	FOG	N/A	12/19/2016 9:52	12/19/2016 10:15	Email	250	Visual/Rate of approximate flow and time	YES	YES; Straits Pond		YES	Yes - 5 MH's and 700 feet of sewer pipe were cleaned as well as clearing blockage		Straits Pond
12/30/2016	Business	26 Western Avenue	Blockage	On December 30, Hull WPCF staff responded to a sewer back-up at 26 Western Avenue. Upon arrival, it was determined that sewage was backing up into a detached garage. After further investigation, the upstream manhole was found to be surcharged and the downstream manhole was found to be flowing freely. On January 5, 2017, HUB Construction and Rasano Davis returned to unplug blockage in sewer pipe, and install cleanout port for improved maintenance outlet.	Debris/FOG in sewer main line	N/A	12/30/16 12:30pm	12/30/2016 12:30pm	Email	360	Visual & Calculated	NO	NO		YES	Sewer blockage was cleared and a cleanout port was installed.		N/A
3/13/2017	Home	76 Atlantic Avenue	Blockage	Abandoned PVC line was plugged with roots; Asset previously unmapped and contains cross country easment	Roots	N/A	3/9/2017 14:00	3/9/2017 14:00	Email	Unknown	Visual	NO	N/A		YES	Excavation performed to remove blocked pipe and replace with new section of pipe; Lime applied at ground surface where spill occurred.		Unknown
4/1/2017	WPCF	1111 Nantasket Avenue	Weather	CCT Overflow due to high flow event. Influent and Effluent pumps operating at full capability	N/A	N/A	4/1/2017 14:00	4/1/2017 16:45	Email	10,000 - 15,000	Calculated	YES	YES; Allerton Harbor		YES	The overall outfall capacity should be assessed to determine if an overflow pipe to the ocean outlet is necessary for storms above 6 MGD (this storm experienced 8 - 9 MGD flows)		In WPCF driveway Hull Bay
5/31/2017	WPCF	1111 Nantasket Ave (WWTP) N 42 degrees 18.348' W 070 degrees 53.987'	Mechanical	Plant Influent flow surge from upstream cleaning plug removal caused slug of flow to WPCF. With both primary clarifiers offline, the allowable flow through the structure was exceeded	N/A	7/26/2016	5/31/2017 014:30	5/31/2017 14:40	Email	700	Visual & Calculated	YES	Allerton Harbor	Primary Clarifier was immediately brought on-line to accommodate overflow	YES	Vactor truck cleaned nearby driveway and street/affected catch basins; SOP was updated, level monitor recommended to be installed at Primary Distribution box and an overflow pipe to be assessed and installed.	7/26/2016	In WPCF driveway Hull Bay



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